

Two new species of the *Tenthredo fortunei* group (Hymenoptera: Tenthredinidae) from China

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Abstract: Two new species of *Tenthredo fortunei* group from China are described: *Tenthredo nigrocaudata* Niu, Hu & Wei sp. nov. and *Tenthredo novemmacula* Niu, Hu & Wei sp. nov.

Key words: Symphyta; Tenthredininae; *Tenthredo*; taxonomy; sawflies

叶蜂属槌腹叶蜂种团两新种记述（膜翅目：叶蜂科）

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摘要: 记述中国叶蜂科叶蜂属槌腹叶蜂种团 *Tenthredo fortunei* group 2 新种: 黑尾槌腹叶蜂 *Tenthredo nigrocaudata* Niu, Hu & Wei sp. nov. 和九斑槌腹叶蜂 *Tenthredo novemmacula* Niu, Hu & Wei sp. nov.

关键词: 广腰亚目; 叶蜂亚科; 叶蜂属; 分类; 叶蜂

Introduction

Tenthredo Linnaeus, 1758 is the largest genus of Tenthredinidae with more than 1000 extant species worldwide (Taeger *et al.* 2010) and 312 species reported from China (Wei 2006; Wei *et al.* 2006; Niu & Wei 2008; Wei & Niu 2009; Haris 2009; Zhao *et al.* 2010; Niu & Wei 2011; Yan *et al.* 2012; Hu & Wei 2013a, b; Liu & Wei 2013; Shang & Wei 2013a, b; Zhang & Wei 2013; Liu *et al.* 2016; Taeger *et al.* 2016).

The name of the *Tenthredo fortunei* group was firstly used by Wei *et al.* (2003) but the group was not defined in the paper. Hu & Wei (2013b) defined the *T. fortunei* group and listed 23 known species for this group. In this paper, two additional new species of the *T. fortunei* group from China are described.

Material and methods

The specimens were examined with a Leica S8APO dissection microscope. Adult images

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were taken with a Nikon D700 digital camera and the series of images were montaged using Helicon Focus (©HeliconSoft). Detail images were taken with Leica Z16 APO/DFC550. All images were further processed with Adobe Photoshop CS 6.0.

Morphological descriptions of new species are based on the holotype. The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002).

Type specimens of these new species are deposited in the Insect Collection of Central South University of Forestry and Technology, Changsha, Hunan, China (CSCS).

Taxonomy

Diagnosis of the *Tenthredo fortunei* group

Body usually dark reddish brown to dark yellow brown, seldom largely black; the second abdominal segment usually narrower than the first, the 5th to 7th segments much broader than other segments in lateral view; clypeus much broader than the shortest distance between eyes; eyes very large, the shortest distance between them about half the longest axis of an eye; the supraantennal tubercles flat or weakly elevated, almost absent; temple very short and distinctly narrowed backwards in dorsal view; antenna shorter than abdomen, the third antennomere distinctly longer than the fourth; head dorsally and mesopleuron impunctate or sparsely and shallowly punctured, seldom densely punctate; mesepisternum roundly or angularly elevated, without distinct fovea at middle; forewing hyaline or with a longitudinal infusate stripe, pterostigma always yellow brown.

The nearest species group to the *Tenthredo fortunei* group is the *Tenthredo omphalica* group. The *Tenthredo fortunei* group differs from the *Tenthredo omphalica* group by the second abdominal segment usually distinctly narrower than the first segment; the subapical abdominal segments distinctly enlarged in lateral view; and the mesepisternum without a distinct apical fovea at middle.

1. *Tenthredo nigrocaudata* Niu, Hu & Wei sp. nov. (Figs. 1–12)

Female. Body length 17–19 mm (Fig. 1). Body dark reddish brown; labrum, clypeus, lower half of inner orbit and face, narrow margin of upper half of inner orbit, ventral part of abdominal tergites 2–5 and sternites 2–5 entirely, yellowish white; bottom of lateral fovea, ocellar loop, apex of fifth antennomere and antennomeres 6–9 entirely, posterior of 5th abdominal tergite, abdominal segments 6–10 entirely and ventral margin of ovipositor sheath, black; legs yellow brown. Wings yellowish hyaline with a broad longitudinal smoky stripe along vein Rs, vein C and pterostigma yellow brown, other veins mostly black brown (Fig. 1).

Labrum and clypeus sparsely punctured, strongly shiny; lower half of inner orbit impunctate, upper half shallowly and sparsely punctured; front and temple with shallow, larger and denser punctures, shiny; postocellar area and hind orbit minutely and shallowly punctured; mesonotum weakly shiny, with large and coarse punctures; mesoscutellum more shallowly punctured than mesonotum; scutellar appendage without punctures or microsculptures, smooth; elevated upper half of mesepisternum densely punctured, anterior and posterior margins shallowly and faintly punctured, lower half of mesepisternum shallowly and sparsely

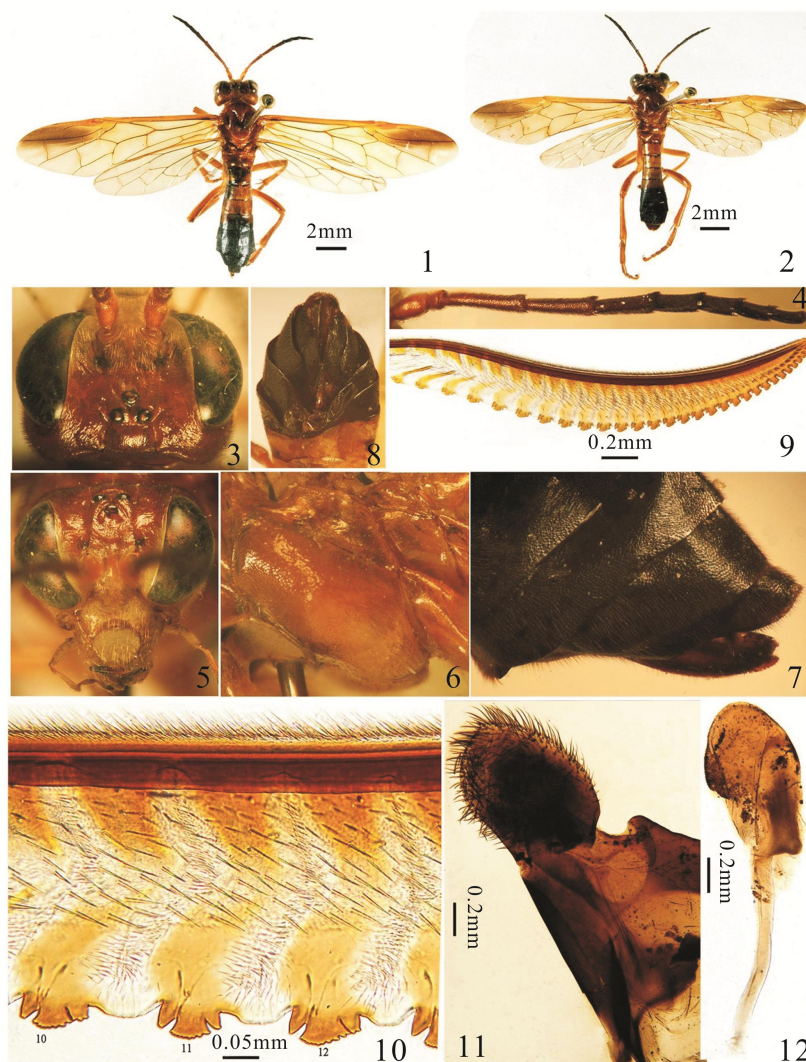
punctured; mesepimeron shiny, with shallow and sparse punctures; metapleuron shiny, shallowly and sparsely punctured, without microsculpture; first abdominal terga smooth, middle and lateral margins minutely and shallowly punctured, shiny; tergites 2–4 feebly microsculptured, faintly shiny, other tergites with minute and shallow punctures and microsculptures, weakly shiny.

Labrum broad, apex round; clypeus slightly elevated, broader than shortest distance between eyes, anterior incision broad and deep, bottom round and obtuse, 0.4 times as deep as length of clypeus, apex of lateral lobes obliquely truncate (Fig. 5); malar space about 0.5 times diameter of lateral ocellus; shortest distance between eyes 0.5 times longest axis of eye; frons flat, slightly below top of eyes, frontal wall recognizable; supraantennal tubercles hardly elevated, merged to frons, median fovea very shallow, almost flat; lateral fovea deep; interocellar and postocellar furrows fine and deep; POL : OOL : OCL = 5 : 17 : 13; postocellar area obtusely elevated, 1.7 times as broad as long, without middle longitudinal furrow, marginal carina low and obtuse, recognizable; lateral furrows broad and deep, distinctly divergent backwards; temple 0.33 times as long as eyes in dorsal view, lateral sides narrowed (Fig. 3); occipital carina complete, sharp, without fold. Antenna as long as head and thorax together, 2.0 times head breadth, pedicellum 1.2 times as long as broad, third antennomere 1.25 times as long as fourth, subapical antennomeres hardly enlarged or reduced, 7th and 8th antennomeres about 2 times as long as broad (Fig. 4). Mesoscutellum strongly elevated, with obtuse peak, posterior slope with low and faint middle carina; middle of posttergite distinctly elevated, without middle carina or middle furrow, 2 times as long as diameter of lateral ocellus; cenchri distance 3.5 times breadth of a cenchrus; middle of mesepisternum obtusely elevated, without acute peak, ventral spur absent (Fig. 6). Inner tibial spur of hind leg 0.5 times as long as metabasitarsus, metabasitarsus slender, as long as following three tarsomeres together; claw slightly broadened toward base, without distinct basal lobe, inner tooth shorter than apical tooth. Vein cu-a meeting cell 1M at basal 1/4, vein 2r meeting cell 2Rs beyond middle, cell 2Rs 1.4 times as long as 1Rs; hind anal cell sessile. First abdominal terga strongly elevated, distinctly broader than second tergite, posterior incision broad and shallow; abdominal segments 5–7 much higher (broader) than other segments in lateral view, posterior margins of 7th sternite lateral to middle process obliquely truncate, without auriform protuberance (Fig. 8). Ovipositor sheath 0.9 times as long as middle tibia, apical sheath 1.3 times as long as basal sheath, dorsal apical corner slightly protruding in lateral view (Fig. 7); sheath in dorsal view narrow and long, with short and hardly curved lateral setae. Lancet slender, with 30 serrulae, serrulae distinctly protruding (Fig. 9), annular spine bands narrow, distinctly curved with dense spines; 10th–12th serrulae from base as in Fig. 10.

Male. Body length 13–15 mm (Fig. 2). Body colour and structure similar to female except for: clypeus small, shortest distance between eyes 0.4 times longest axis of eye; postocellar area with shallow median longitudinal furrow, head behind eyes strongly narrowed in dorsal view; subgenital plate as long as broad, apical margin obtusely protruding; gonoforcep as in Fig. 11, harpe longer than broad, apical margin round; penis valves as in Fig. 12, valviceps of penis valve simple, without distinct lateral process.

Holotype. ♀, China, Shaanxi, Zhouzhi, Louguantai, 34°02.939'N, 108°19.303'E; alt. 899 m, 25-V-2006, Qing YANG leg. **Paratypes.** 1♀, Gansu, Tianshui, Mt. Xiaolongshan, 34°16.275'N, 106°08.201'E; alt. 1049 m, 07-VII-2007, Meicai WEI leg.; 1♀, Gansu, Tianshui,

Zaojiao County, Mt. Sun Mountain, 15-VI-2006, Junzhen WU leg.; 1♀1♂, Shaanxi, Liuba, Sangyuan Forest Farm, 33°44.937'N, 107°08.343'E, alt. 1250 m, 18-V-2007, Xun ZHU leg.; 1♀, Hubei, Three Rivers, Mt. Shennongjia, 31°34.329'N, 110°09.803'E, alt. 835 m, 26-V-2008, Fu ZHAO leg.; 1♀, Hubei, Cradle Ravine, Mt. Shennongjia, 31°29.104'N, 110°22.878'E, alt. 1430 m, 19-VII-2009, JIAO Zhao leg.; 2♀, Hubei, Cradle Ravine, Mt. Shennongjia, 31°29.815'N, 110°23.260'E, alt. 1360 m, 19-V-2010 and 18-V-2011, Zejian LI leg.



Figures 1–12. *Tenthredo nigrocaudata* Niu, Hu & Wei sp. nov. 1. Adult female, dorsal view; 2. Adult male, dorsal view; 3. Head of female, dorsal view; 4. Antenna of female; 5. Head of female, frontal view; 6. Mesopleuron and metapleuron of female; 7. Ovipositor sheath, lateral view; 8. Apex of female abdomen, ventral view; 9. Lancet; 10. The 10th–12th serrulae; 11. Gonoforcep; 12. Penis valve.

Etymology. This species is named after the colour pattern of the abdomen which is black at apical half and much different from the body colour.

Remarks. This new species is close to *T. nigricornis* Malaise, 1945 but differs from the latter in antenna reddish brown at basal half and black at apical half; the antennal flagellum as long as head and thorax together, the subapical antennomeres hardly enlarged, the third antennomere 1.25 times as long as the fourth; mesoscutellum coniformly elevated, with obtuse median carina; mesopleuron minutely and densely punctured, without black or white macula; legs reddish brown, without black macula; the basal half of abdomen dark reddish brown and the apical half black; serrulae with big subbasal teeth, and penis valves without distinct lateral process. In *T. nigricornis* Malaise, the antennal flagellum entirely black and much shorter than head and thorax together, the subapical antennomeres distinctly enlarged, the third antennomere 1.9 times as long as the fourth; mesoscutellum roundly elevated, without median carina; mesopleuron with some large and sparse punctures mixing with minute punctures, and with black and white maculae; legs reddish brown with long black stripe; the abdominal tergites largely black; serrulae almost flat with minute subbasal teeth, and penis valves with a triangular lateral process.

Distribution. China (Gansu, Shaanxi, Hubei).

2. *Tenthredo novemmacula* Niu, Hu & Wei sp. nov. (Figs. 13–24)

Female. Body length 12–13 mm (Fig. 13). Body fulvous, head below antennal sockets, inner orbit largely, lower 2/3 of hind orbit, two small oval spots in front of middle ocellus, a square spot in front of lateral ocellus, lateral furrow and lateral round spot, both terminals of marginal carina of postocellar area, two basal antennomeres, large spot on lateral of pronotum and narrow posterior margin, inner margin of tegula, lateral large spot on mesoscutellum, posttergite entirely, upper half of mesepisternum largely, narrow upper margin of mesepimeron, metepisternum, metapostnotum, first abdominal terga largely, posterior margin of tergites 2–4, a pair of spots on tergites 6–9, large lateral spot on 9th tergite, and 10th tergite largely bright yellow; bottom of lateral fovea, anterior margin of upper hind orbit, some furrows of mesoscutum, ventral margin of ovipositor sheath, black brown; antenna pale brown; leg fulvous, a long stripe on outer side and a short stripe on ventral side of hind coxa, basal short stripe on dorsum of fore and middle femora, a long stripe on dorsum of femur, dorsum of apical 4/5 of each tibia, dorsal stripe of each tarsi, dark brown. Wings hyaline, without infuscate stripe, vein C and pterostigma yellow brown, other veins mostly black brown (Fig. 13).

Head strong shiny, labrum and clypeus sparsely and shallowly punctured; inner orbit with minute and shallow punctures, without microsculptures; front shallowly and sparsely punctured without microsculptures; postocellar area and hind orbit minutely, shallowly and densely punctured; temple with minute punctures; mesonotum feebly shiny, with larger and denser punctures; mesoscutellum coarsely and densely punctured; scutellar appendage smooth, without punctures and microsculpture; mesepisternum with dense but shallow punctures, mesepimeron shiny, shallowly and obscurely punctured; metapleuron shiny with indistinct punctures and microsculptures; first abdominal terga smooth, lateral margins finely microsculptured, other abdominal tergites distinctly microsculptured, weakly shiny.

Labrum broad, apex round; clypeus slightly elevated, broader than shortest distance between eyes, anterior incision deep and broad, bottom round, 0.4 times as deep as length of clypeus, lateral lobe obtuse at apex (Fig. 17); malar space about 0.4 times diameter of lateral ocellus; shortest distance between eyes 0.45 times longest axis of eye; frons flat, below top of

eyes, without frontal wall; supra-antennal tubercles not elevated, merged to fronts, median fovea obscure; lateral fovea narrow and deep, furrow-like; interocellar furrow broad and deep, postocellar furrow narrow and deep; POL : OOL : OCL = 5 : 12 : 8; postocellar area 1.6 times as broad as long, without middle carina or middle furrow, anterior half obviously elevated, marginal carina distinct; lateral furrows narrow, almost straight, faintly divergent backwards; head behind eyes 0.4 times as long as eyes, narrowed in dorsal view (Fig. 15); occipital carina complete, sharp, without fold. Antenna 0.85 times as long as head and thorax together, pedicellum 1.2 times as long as broad, third antennomere 1.25 times as long as fourth, subapical flagellomeres slightly enlarged, 7th and 8th antennomeres about 1.3 to 1.4 times as long as broad (Fig. 16). Mesoscutellum strongly elevated, clearly higher than top of mesonotum, with obtuse peak and distinct but low middle carina; middle of scutellar appendage elevated, without middle carina, 2 times as long as diameter of lateral ocellus; cenchri distance 2.4 times as broad as breadth of a cenchrus; middle of mesepisternum weakly and obtusely elevated, without acute peak, ventral spur absent (Fig. 18). Inner tibial spur of hind leg 0.7 times as long as metabasitarsus, metabasitarsus slender, slightly curved, as long as following three tarsomeres together; claw base slightly broadened, without distinct basal lobe, inner tooth shorter than apical tooth. Vein cu-a meeting cell 1M at basal 1/3, vein 2r meeting cell 2Rs beyond middle, cell 2Rs 1.25 times as long as 1Rs; hind anal cell petiolate, about 0.2 to 0.25 times as long as cu-a. First abdominal terga strongly elevated, broader than second tergite, posterior incision broad and large; posterior margin of sternite 7 lateral to middle process roundly curved, without auriform protuberance (Fig. 20). Ovipositor sheath slightly longer than middle tibia, apical sheath 1.3 times as long as basal sheath, dorsal apical corner slightly extruded in lateral view (Fig. 19); sheath in dorsal view narrow and long, with obviously curved lateral setae. Lancet broad, with 25 serrulae, serrulae almost flat (Fig. 21), middle serrulae each with 1 proximal and 6–7 distal teeth, annular spine bands narrow with dense setae; 8th–10th serrulae from base as in Fig. 22.

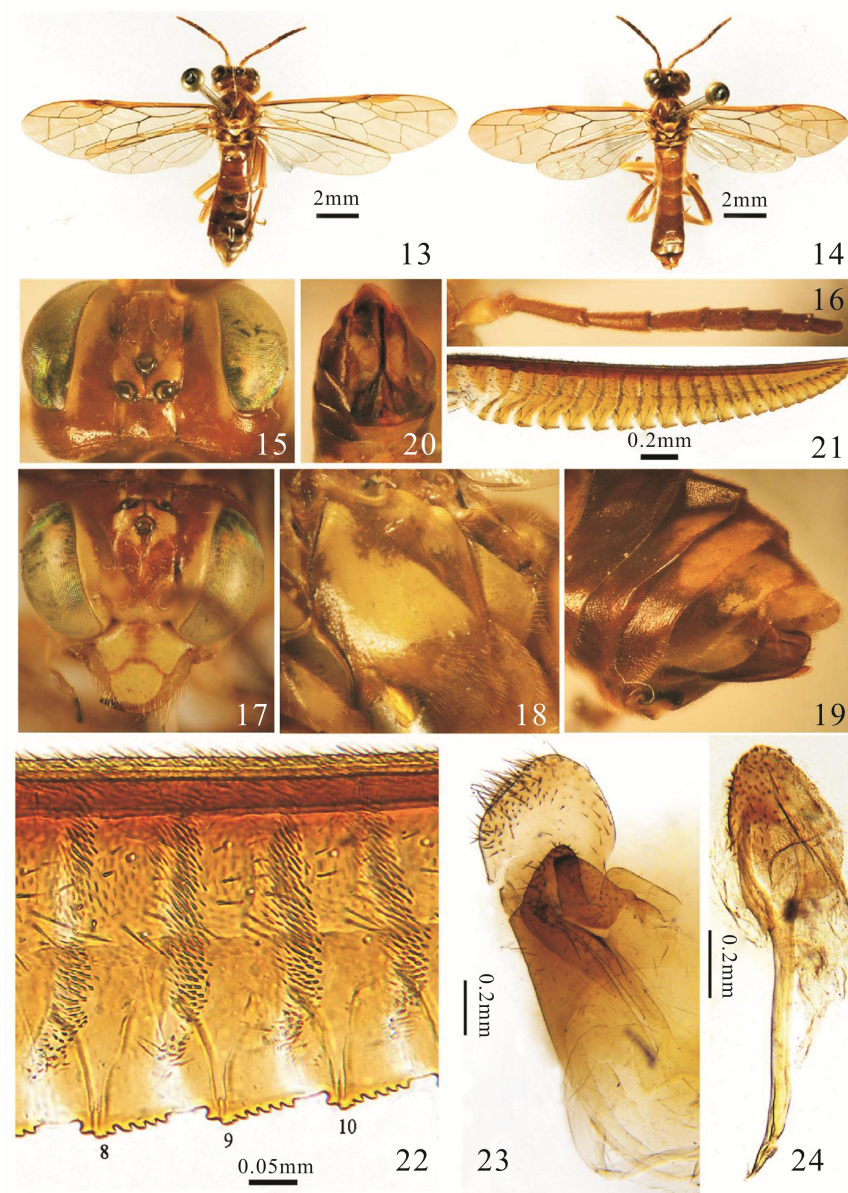
Male. Body length 11–12 mm (Fig. 14). Body colour and structure similar to female except for antennal flagellum dark brown, subgenital plate about as long as broad, apical margin obtusely truncate; gonoforcep as in Fig. 23, harpe small, about as long as broad, apex obviously protruding; penis valve as in Fig. 24, valviceps simple, without distinct lateral process.

Holotype. ♀, **China**, Anhui, Qingyang, Mt. Jiuhuashan, 30°64'N, 117°84'E; alt. 700 m, 09-V-2007, Xiaoni ZHU leg. **Paratypes.** 1♂, Zhejiang, Mt. Tianmushan, alt. 270–730 m, 08-V-1963; 2♂, Hunan, Taoyuandong, alt. 900–1000 m, 23-IV-1999, Lei HUANG & Tiejun DENG leg.; 3♀3♂, Hunan, Yongzhou, Mt. Shunhuangshan, alt. 800–1000 m, 27-IV-2004, Meicai WEI, Yingke HE & Shouzhu LIU leg.; 1♀2♂, Hunan, Suining, Huangsang, alt. 600–900 m, 22-IV-2005, Yang LIN leg.

Etymology. This species is named after the 9 maculae on the abdominal tergites 6–10.

Remarks. This new species is close to *T. smithi* Kirby, 1882, but differs from it in the postocellar area with a distinct marginal carina; the mesopleuron obtusely and weakly elevated without acute peak; antennal flagellum entirely pale brown, the 7th and 8th antennomeres about 1.3 to 1.4 times as long as broad; the 6th–8th abdominal tergites each with a pair of fulvous spots; serrulae almost flat, with larger subbasal teeth; harpe short and small, about as long as broad, and penis valves different. In *T. smithi* Kirby, the postocellar area without a

distinct marginal carina; the mesopleuron strongly elevated with a distinct and acute peak; the middle flagellomeres dark brown and apical flagellomeres yellowish brown, the 7th and 8th antennomeres more than 2 times as long as broad; the 6th–8th abdominal tergites each with a big middle fulvous spot; serrulae distinctly oblique, apex round, the subbasal teeth minute; harpe narrow and much longer than broad, and penis valves different.



Figures 13–24. *Tenthredo novemmacula* Niu, Hu & Wei sp. nov. 13. Adult female, dorsal view; 14. Adult male, dorsal view; 15. Head of female, dorsal view; 16. Antenna of female; 17. Head of female, frontal view; 18. Mesopleuron and metapleuron of female; 19. Ovipositor sheath, lateral view; 20. Apex of female abdomen, ventral view; 21. Lancet; 22. The 8th–10th serrulae; 23. Gonoforcep; 24. Penis valve.

Distribution. China (Anhui, Zhejiang, Hunan).

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